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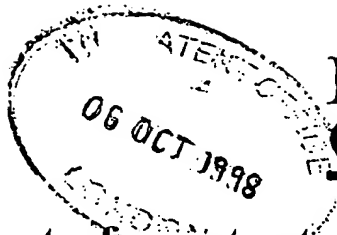
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Request for grant of a patent

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Cardiff Road
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1. Your reference

39766

2. Patent application number
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9821790.4

3. Full name, address and postcode of the or of each applicant (underline all surnames)

Mars U.K. Limited
3D Dundee Road
Slough
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SL1 4LW

Patents ADP number (if you know it)

If the applicant is a corporate body, give the country/state of incorporation

07475 37341
United Kingdom

4. Title of the invention

Animal Stereotypy

5. Full name, address and postcode in the United Kingdom to which all correspondence relating to this form and translation should be sent

Reddie & Grose
16 Theobalds Road
LONDON
WC1X 8PL

Patents ADP number (if you know it)

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6. If you are declaring priority from one or more earlier patent applications, give the country and the date of filing of the or of each of these earlier applications and (if you know it) the or each application number

Country

Priority application
(If you know it)

Date of filing
(day/month/year)

7. If this application is divided or otherwise derived from an earlier UK application, give the number and the filing date of the earlier application

Number of earlier application

Date of filing
(day/month/year)

8. Is a statement of inventorship and of right to grant of a patent required in support of this request? (Answer 'Yes' if:

- a) any applicant named in part 3 is not an inventor, or
 - b) there is an inventor who is not named as an applicant, or
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YES

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Continuation sheets of this form

Description	5
Claim(s)	3
Abstract	-
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1/234

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Priority documents	-
Translations of priority documents	-
Statement of inventorship and right to grant of a patent (<i>Patents Form 7/77</i>)	-
Request for preliminary examination and search (<i>Patents Form 9/77</i>)	1 ✓
Request for substantive examination (<i>Patents Form 10/77</i>)	-
Any other documents (please specify)	

11. I/We request the grant of a patent on the basis of this application.

Signature

Date

6 October 1998

12. Name and daytime telephone number of person to contact in the United Kingdom

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Animal Stereotypy

The present invention relates to the treatment and prevention of animal stereotypies.

5 Stereotypies are animal behavioural disorders. They are characterised by the performance of repetitive, invariant movements which have no obvious function. Equine stereotypies are of particular concern to owners of horses because the condition and performance of a horse which
10 displays stereotypic behaviour is often adversely affected. This can substantially reduce the market value of a horse. Equine stereotypies include oral stereotypies such as crib-biting and wind-sucking, and locomotor stereotypies such as weaving and box-walking.

15 The cause or causes of stereotypies are not known. This lack of knowledge has severely hampered the development of effective treatments and preventatives for stereotypies. In the abstract of a study by Christine Nicol and Amanda Waters, entitled "The treatment and Prevention of Equine
20 Stereotypies", theories on possible causes of equine stereotypy are given. It is noted that stereotypies are frequently regarded as functionless pathologies of the nervous system. It has also been proposed that stereotypies serve some function; oral stereotypies have been suggested
25 to be important for normal feeding and digestive function. Alternative views are that they are developed by an animal as a way of dealing with stress or boredom. A further theory is that animals learn to perform stereotypies by imitating other animals that perform them.

30 Preventative measures for equine stereotypy based on these theories include use of stable toys to stop a horse from becoming bored or stressed, or isolation of a horse from other horses to stop it from learning stereotypies by imitation. Treatment of oral stereotypies such as crib-
35 biting can involve more harsh measures, for example fitting the horse with a collar to prevent it from crib-biting, or

even surgery. Typically, surgery involves cutting the ventral neck muscles and/or the nerves that supply them. Other forms of control include aversion therapy. Here, the horse may be given an electric shock, or physical admonishment when it performs a stereotypy.

The above treatments or preventative measures have been found to be unsatisfactory. Use of stable toys has not been found to be an effective way of preventing equine stereotypy. Physical prevention of stereotypy, either by use of a collar or surgery, is not successful because the animal still has the urge to perform the behaviour. When the collar is removed, a horse will often perform a stereotypy more intensively than before. After surgery, the animal may still be able to perform the stereotypy by utilising other muscle groups. Preventatives such as social isolation, collar fitting, aversion therapy and surgery are undesirable.

In the abstract referred to above, it is disclosed that an epidemiological study has shown that a significant number of horses develop stereotypic behaviour during the immediate post-weaning period. At weaning, the mare-foal bond is broken, but feeding and housing practices are often also changed at this time. The discovery that stereotypic behaviour often begins in the immediate post-weaning period has not so far led to a treatment or preventative for stereotypy because it is not clear which factor or combination of factors are significant in the onset of stereotypy.

There is, therefore, an urgent need to provide effective treatments and preventatives for stereotypy which do not involve any undesirable practices being performed on an animal being treated.

According to the invention there is provided a composition for use in the treatment or prevention of animal stereotypy which comprises at least one of: a combination of fat and fibre; and an antacid.

According to the invention there is also provided a pharmaceutical composition for use in the treatment or prevention of animal stereotypy which comprises at least one of: a combination of fat and fibre; and an antacid.

5 There is also provided according to the invention a method of treatment or prevention of animal stereotypy which comprises controlling the gut pH of an animal.

 The gut pH of the animal may be controlled by administering a composition comprising at least one of: a
10 combination of fat and fibre; and an antacid to the animal.

 Compositions according to the invention may be in a pharmaceutically acceptable carrier, excipient or diluent.

 The amount of fat in a composition according to the invention may be from about 2% to about 15% by weight of the
15 composition.

 The amount of fibre in a composition according to the invention may be from about 8% to about 20% by weight of the composition.

 An example of an antacid for use in a composition according to the invention is Neigh-Lox.
20

 The gut pH of the animal may alternatively or additionally be controlled by inhibiting gastric acid secretion. Gastric acid secretion may be inhibited by administering a proton pump inhibitor, such as Omeprazole,
25 to the animal. It will be appreciated that the gut pH of an animal may also be controlled in other ways.

 It is believed that once an animal has learnt a stereotypy, the stereotypic behaviour becomes fixed and the animal will perform the stereotypy even if the original
30 cause of the behaviour has been removed. Consequently, the animal should be treated using a composition or method according to the invention before any stereotypic behaviour becomes fixed, and preferably before, or soon after, the animal develops any stereotypic behaviour.

35 Compositions according to the invention may be included in the diet of the animal from birth.

Compositions according to the invention may be included in the diet of the animal's mother while she is lactating. This is because the mother's diet influences the nutritional content of the milk which the animal receives and because
5 the animal may eat its mother's feed before it is weaned; foals invariably eat their dam's feed before they are weaned.

Compositions according to the invention may be included in feed and the said feed fed to the animal as it is being
10 weaned onto solid food.

Compositions according to the invention may be included in the animal's diet post weaning.

Compositions and methods according to the invention may be particularly effective at preventing stereotypy when the
15 animal being treated is a weaning or recently weaned animal.

Foals are typically weaned when they are four to six months old.

Use of compositions and methods according to the invention may be particularly effective in the treatment and
20 prevention of stereotypies linked with gut function in all *equidae*, non-ruminant herbivores, and non-ruminant omnivores, such as in the treatment and prevention of equine crib-biting.

The reason that compositions and methods according to
25 the invention may be particularly effective in the treatment and prevention of animal stereotypy is not known. However, it is thought that at least some forms of stereotypy may result if the gut pH of an animal is persistently low. Pain caused by low gut pH may cause the animal to perform a
30 stereotypy, such as crib-biting, which stimulates the flow of saliva into the gut. This saliva would then be expected to increase the gut pH and alleviate the pain. The fact that significant numbers of horses develop stereotypic behaviour during the immediate post-weaning period may be
35 because the diet of a foal changes significantly during weaning. If such a dietary change results in a persistent decrease in gut pH, then stereotypic behaviour may be more

likely to occur. Administration of compositions according to the invention to an animal, especially a weaning or recently weaned animal, may ensure that its gut pH is not persistently low and remove, therefore, the need for the
5 animal to stimulate the flow of saliva into the gut.

Compositions and methods according to the invention may be significantly more effective in the treatment and prevention of animal stereotypy than prior treatments and preventatives. In addition, treatment of animals using
10 compositions and methods according to the invention does not involve any undesirable practices being performed on the animal.

Claims

1. A composition for use in the treatment or prevention of animal stereotypy which comprises at least one of: a combination of fat and fibre; and an antacid.
- 5 2. A pharmaceutical composition for use in the treatment or prevention of animal stereotypy which comprises at least one of: a combination of fat and fibre; and an antacid.
- 10 3. A composition according to claim 1 or 2 in which at least one of the fat and fibre combination and the antacid are in a pharmaceutically acceptable carrier, excipient or diluent.
4. A composition according to any of claims 1 to 3 in which the amount of fibre in the composition is from about 8% to about 20% by weight of the composition.
- 15 5. A composition according to any preceding claim in which the amount of fat in the composition is from about 2% to about 15% by weight of the composition.
- 20 6. A method of treatment or prevention of animal stereotypy which comprises controlling the gut pH of an animal.
7. A method according to claim 6 in which the gut pH of the animal is controlled before any stereotypic behaviour performed by the animal becomes fixed.
- 25 8. A method according to claim 6 in which the gut pH of the animal is controlled before, or shortly after, it develops any stereotypic behaviour.
9. A method according to claim 6 in which the animal is a weaning, or recently weaned animal.

10. A method according to claim 6 in which the animal is a weaned animal.
11. A method according to claim 6 in which the gut pH of the animal is controlled from birth.
- 5 12. A method according to any of claims 6 to 11 in which the gut pH of the animal is controlled by administering a composition according to any of claims 1 to 5 to the animal.
13. A method according to claim 12 in which the composition is included in the animal's diet from birth.
- 10 14. A method according to claim 11, 12 or 13 in which the composition is included in the diet of the animal's mother when she is lactating.
- 15 15. A method according to any of claims 11 to 14 in which the composition is included in feed and the said feed is fed to the animal as it is being weaned.
16. A method according to any of claims 6 to 11 in which the gut pH of the animal is controlled by inhibiting its gastric acid secretion.
- 20 17. A method according to claim 16 in which the gastric acid secretion of the animal is inhibited by administering a proton pump inhibitor to the animal.
18. A method according to any of claims 6 to 17 in which the animal is an *equidae*, a non-ruminant omnivore, or a non-ruminant herbivore.
- 25 19. A method according to claim 18 in which the animal is a horse.

20. A method according to claim 19 in which the stereotypy is crib-biting.
21. Use of a composition according to any of claims 1 to 5 in the manufacture of a medicament for the treatment or
5 prevention of animal stereotypy.
22. A composition substantially as described.
23. A pharmaceutical composition substantially as described.
24. A method substantially as described.